

SUMMARY OF THE MEASUREMENTS ON THE MAGNET
AFTER INSTALLATION ON THE RING BEAM

A. Final measurements before exciting with the main power supply.

No	Date	Quantity measured	Method	Result
1	22/7	Ohmic resistance	Measurement of d.c. voltage and current	$R = 0.30 \Omega$ at 18°C
2	23/7	Resonance frequency of magnet	Excitation at 50th unit with low frequency generator; observation of phase between voltage and current	$f_r = 830 \text{ Hz}$
3	23/7	Voltage increase on 50th unit due to resonance when magnet is supplied with a constant current through a $100 \text{ k}\Omega$ resistor	Excitation as in (2); direct observation of voltage	Increase 10 %/o
4	23/7	Higher harmonics	As for (2) with generator connected to 25th unit	No further resonances observed
5	23/7	Voltage transient	Magnet terminals connected to main power supply. Step voltage of 30 V (from battery) applied to the generator side of the 600 Hz filter. 2 mF condenser not connected.	Maximum voltage across magnet terminals $1.15 \times$ d.c. voltage. Total duration of transient 200 μsec .

No	Date	Quantity measured	Method	Result
6	24/7	Unbalance of main power supply	D.C. voltage to ground on 101 st unit when excited as in (5)	Balancing of supply was improved until d.c. voltage on 101 st unit < 0.1 o/o of voltage on terminals.
7	27/7	Magnet coil insulation	High voltage test	35 m A leakage current at 10 kV d.c.
<u>B. Measurements on magnet excited by main power supply.</u>				
8	28/7	Duration of voltage transient	Observation of voltage across 1 mF capacitor connected to the magnet terminals (copper foil around bus bar)	Same as in 5
9	24/9	Effect on \dot{B} of switching in 2 mF capacitor; 90 o/o voltage, 5 KA	Pick up coil in unit 99	Ripple on \dot{B} decreases from ± 100 o/o to value measured in no 10 within 1 msec after switching, (4 msec after start).
10	24/9	Ripple on \dot{B} in the beginning of the cycle after the 2 mF condensor is switched in; 90 o/o voltage, 5 KA.	Pick up coil in respective magnet units	Ripple ± 0.5 o/o in unit 99 no longer observable in unit 50
11	29/9	Differences in B_{dyn} between various units for 90 o/o voltage and 5 KA	Measurement of $\int (B_i - B_k) dt$ by means of coils in units i and k and integrator	Biggest difference between units of the same type is 0.6 o/o at injection; 0.7 o/o at top field.

No	Date	Quantity measured	Method	Result
12	8/10	Various earth loops	Measurement of insulation resistance after disconnecting the correct earthing strip	Several short circuits between magnet and vacuum chamber were found, which have been removed since
13	12/10	Remanent gradient in quadrupole lenses 99 and 100	Search coil and integrator	$\frac{\partial B}{\partial r} z_{rem}$ between 1 and $2 \times 10^{-7} \frac{Wb}{m^3}$ in the same direction as in adjacent magnet sector.
14	8/10	$\frac{dB}{dt}$ at injection in 101 st unit	Measurement of voltage from coil in block 6	$\left(\frac{dB}{dt}\right)_{inj.} = 1.425 \frac{Wb}{m^2 \text{ sec}}$
	13/10	90 r/o voltage 5 KA		

Measurements made by D. Neet, B. de Raad, K.H. Reich, S.v.d. Meer. All records kept by K.H. Reich.

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Distribution: (open)

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